Headquarters Air Combat Command

Global Hawk Communications Roadmap

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This Briefing is:
UNCLASSIFIED

Purpose

Provide an overview of the plan to migrate Global Hawk from commercial SATCOM wideband to protected military SATCOM

Projected Capability

Operational Capability	FY04	FY05	FY06	FY07	FY08	FY09	FY10
Main Operating Base Standup	x						
Contingency Orbit 1			x	→	→	→	→
CENTCOM FOL or Contingency Orbit 2				x	→	→	→
PACOM FOL or Contingency Orbit 3					x	→	→
EUCOM FOL or Contingency Orbit 4						x	→
Contingency Orbit 5						x	→
Contingency Orbit 6							x
Total FOLs				1	2	3	
Total Orbits			1	2	3	5	6

- **Conduct Sensitive Reconnaissance Operations (SRO) from three FOLs, or…**
- **Execute six simultaneous contingency orbits, or…**
- **Mix SRO and contingency operations**

Overview

- **Reason for change - OSD UAV Roadmap Guidance**
- **Reachback Options**
- **SATCOM Support, Now - FY06**
- **SATCOM Support, FY06 - FY09**
- **SATCOM Support, FY09 - FY12 and beyond**
- **Cost Factors**
- **Summary**

Reason for Change

- UAVs need to migrate from dependence on commercial SATCOM to assured military SATCOM such as Extended Tether Program (ETP), military Ka band on the Wideband Gap-filler System (WGS), and Transformational Communications (TC) Laser *.
- Commercial Ku SATCOM will only support EO/IR/SAR
  - Will not support sensor raw 274 Mbps output required by intel
  - No MASINT & ATC/ATR
  - No Hyper-spectral
- Commercial Ku problems:
  - Not authorized for aircraft use
  - Uncertain access and no access control (comsec)
  - No jam resistance (opsec)
- Click here Global Ku Band Coverage.ppt

*paraphrased from DOD UAV Roadmap

Overview

- OSD UAV Roadmap Guidance
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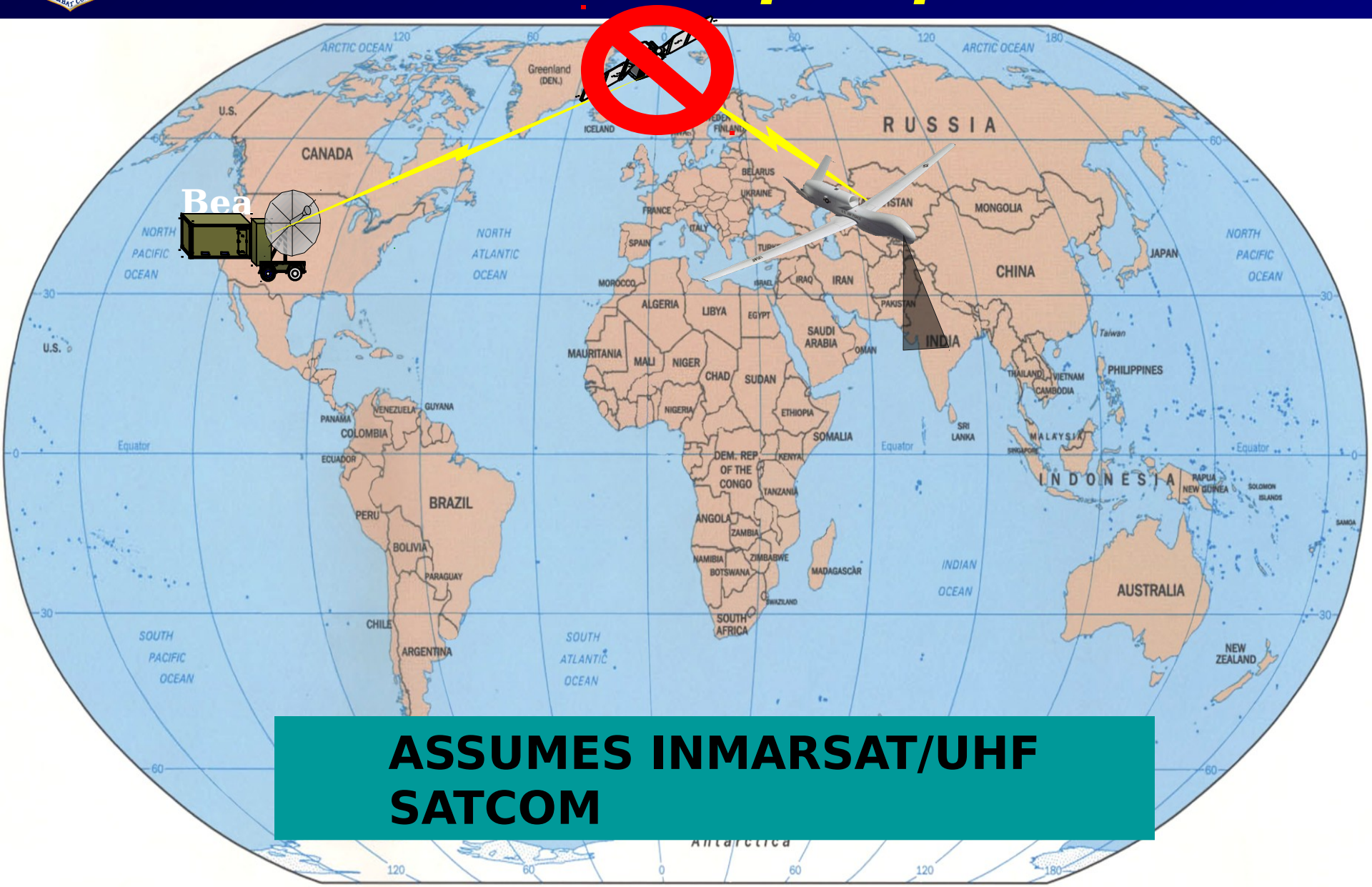
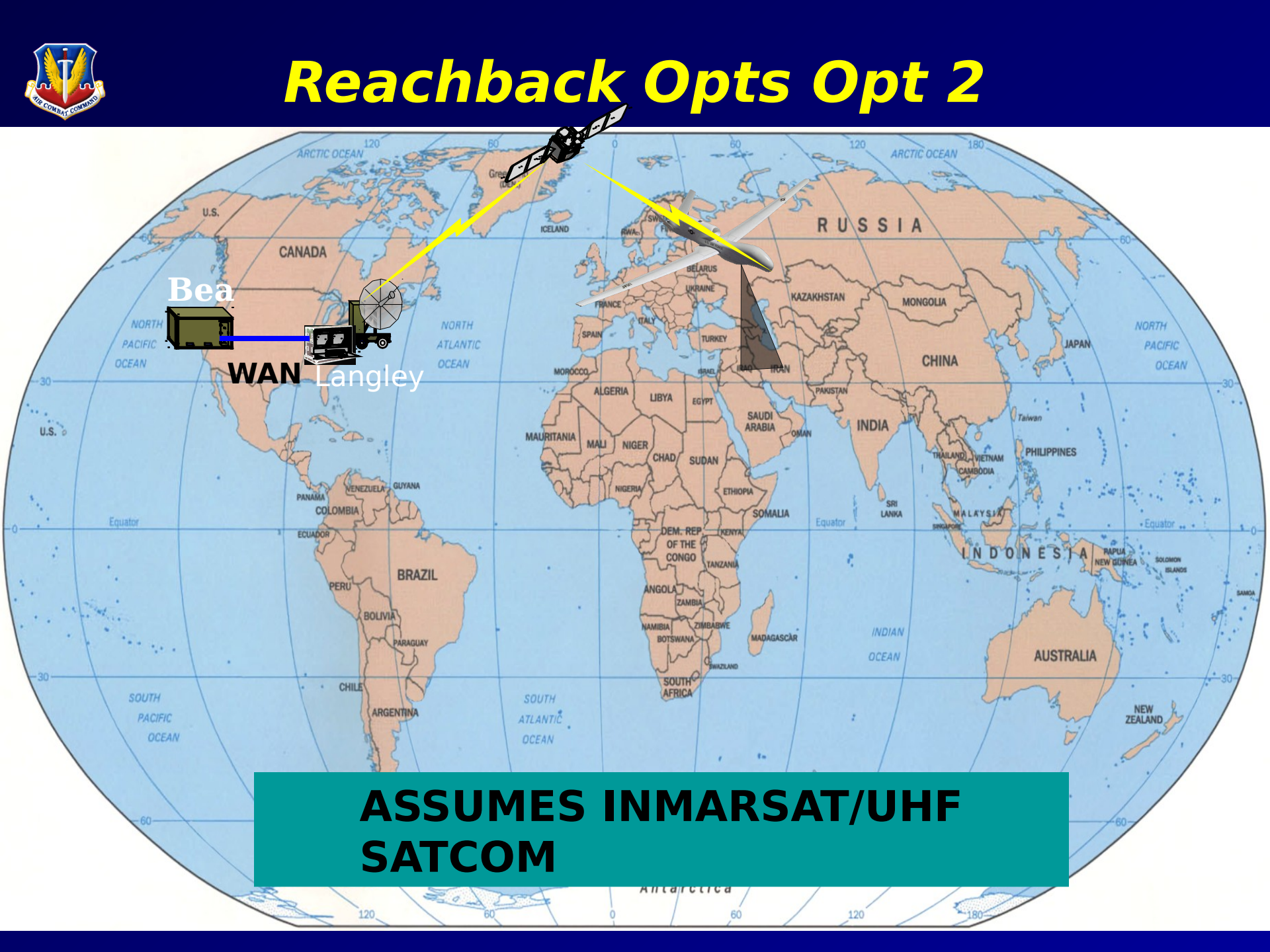
Reachback Ops Opt 1



ASSUMES INMARSAT/UHF SATCOM

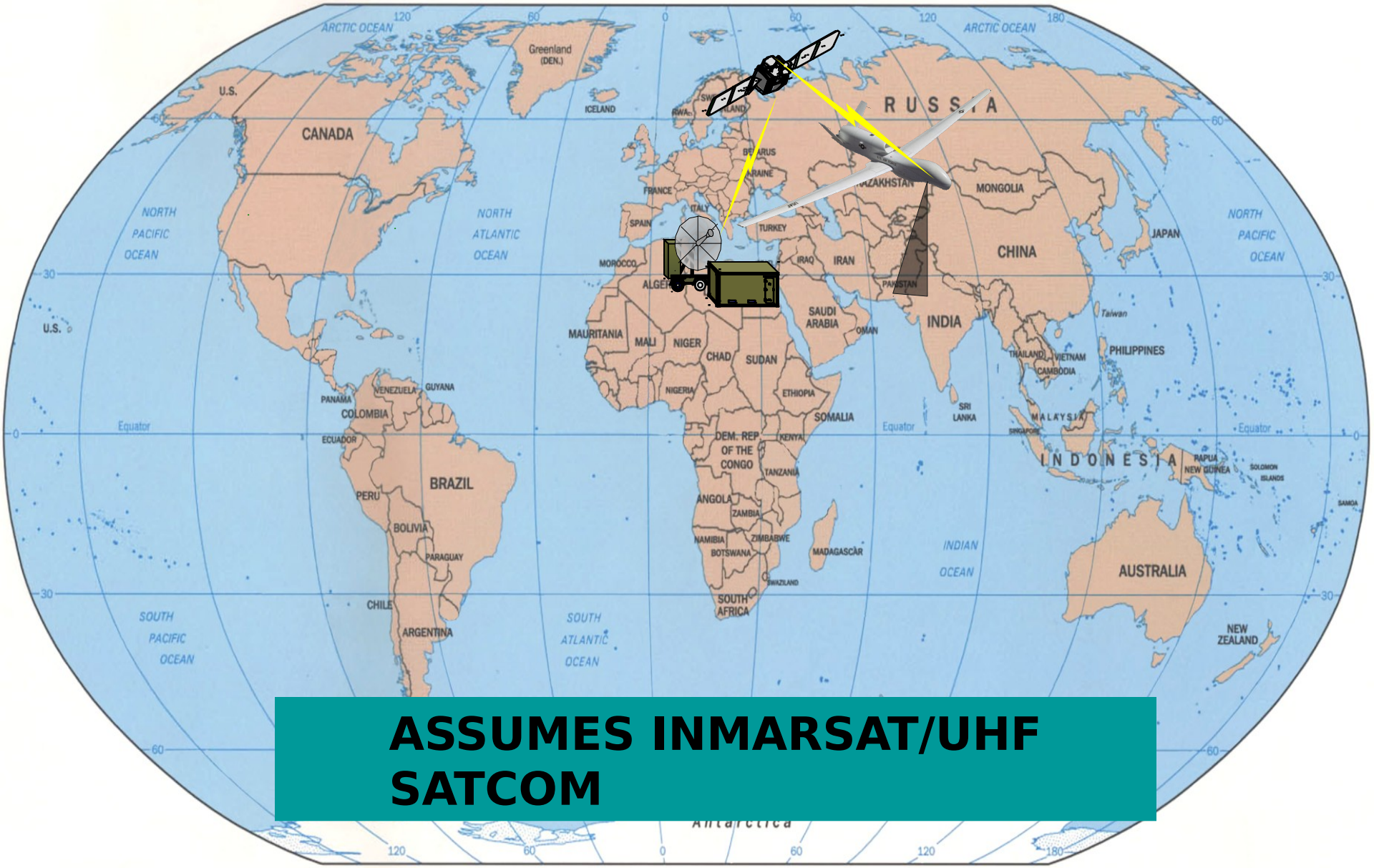
Reachback Opts Opt 2



ASSUMES INMARSAT/UHF SATCOM

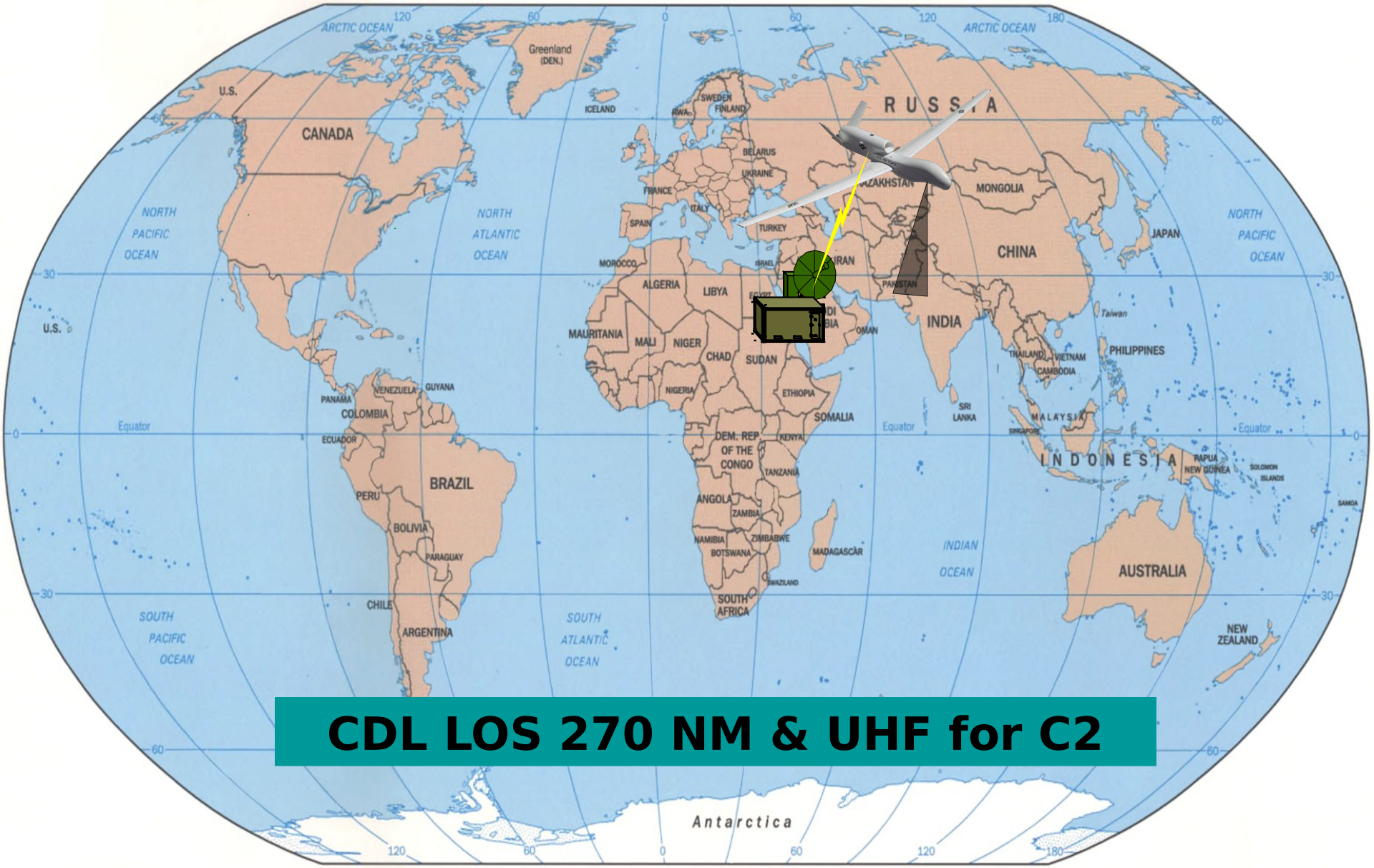
Reachback Ops Opt 3

Reachback Ops Opt 4 - Deploy



ASSUMES INMARSAT/UHF SATCOM

Non Reachback Opt 5



CDL LOS 270 NM & UHF for C2

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SATCOM Support for GH Orbits
Now - 06

- **Ku Commercial (compete for access)**
  - Commercial Ku SATCOM transponders to support ops are on as needed basis – 12 month lease = @ $3-5M – unfunded O&M
  - Supports 20 to 48 Mbps depending on availability
  - Susceptible to jamming
  - Does not support ORD threshold 274 Mbps data rate
- **ETP additional link (Site 6) fee is max $120/minute**
  - Must be shared with U2 (**Compete for time**)
  - Supports 274Mbps
  - Critical reliance on UHF MILSATCOM & INMARSAT for C2 (**High Risk**)
- **Line Of Site (LOS)**
  - Requires MCE to deploy forward
  - Supports 274 Mbps?
  - Requires terrestrial connection to imagery exploiters or deployment of exploiters i.e. DCGS or exploiters deploy too

Only Guaranteed Orbit is CDL

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SATCOM Support for GH Orbits 06 - 09

- **Ku Commercial – no change – training/testing/North&Southcom**
- **ETP – Additional ETP ground stations supports a minimum of (N) OCONUS 274 Mbps at no cost to GH program (06)**
  - **Critical reliance on UHF MILSATCOM & INMARSAT for C2 relieved**
- **LOS CDL – no change**
- **Improved C2 over UHF MILSATCOM with MUOS (09)**
- **JTRS radios deliver beginning in 08**

Partially Guaranteed Orbits Plus LOS

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SATCOM Support for GH Orbits 09 – 12+

- **Ku Commercial - same**
- **ETP Assured for (N) orbits**
- **LOS Includes MP-CDL and advanced CDL**
- **Advanced Wideband Terminals (AWT) & Ground Mobile Terminal (GMT) (09) Integrated into GH system**
- **Wideband Gapfiller System (WGS) 4&5 Ka supt. 274Mbps x 4 (2 orbits per sat WGS 4 & WGS 5 (09))**
  - **WGS does not provide global reachback (in theater Ka)**
  - **See WGS for UAV.ppt**
- **TC makes reachback opt #1 possible with cross links**
  - **Ka supports 274 Mbps Laser supports 1.096 Gbps (FY11)**
  - **AEHF waveform for C2 and data (Anti Jam) up to 45 Mbps**
  - **See Transformational Communications.ppt**

Fully Satisfied Guaranteed Orbit for Reachback

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Cost Factors

- No full relief from deployable capability until FY11+
  - GH must retain all operational options (deployment scenarios) until comms proves we can do otherwise
- No SATCOM funds for SRO flying hours
- No SATCOM funds for AMC-5 (testing & training) post 05
  - Must rely on ETP or find money
- ETP has no C2 link until 06
  - INMARSAT and ETP C2 directed and funded with OSD money
- Cost savings realized in:
  - ETP has no SATCOM cost – DCGS funds ground station O&M
  - WGS and TC have no SATCOM cost (Gov't owned)
  - Flying hours not restricted to SATCOM funding
  - Robust reachback = no need to forward base MCEs and minimizes deployment of Imagery Analysts outside CONUS

Summary

- Current Commercial Ku SATCOM is inadequate and expensive
- ETP gives us (N) OCONUS orbits (free)
- AWT (FAB-T) replaces current Ku terminal to enable use of Ka band on WGS up to 274 Mbps (free)
- AWT also positions GH to use Transformational Communications Architecture
  - removes SATCOM constraints for advanced sensors

Questions

- **Reference Products Available:**
  - **DOD UAV Roadmap**
  - **AWT ORD (Draft)**
  - **WGS support for UAVs Brief**
  - **Transformational Communications Government Reference Architecture (Draft)**